

INDIANA DEPARTMENT OF TRANSPORTATION
MATERIALS AND TESTS DIVISION

VERIFYING BALANCES
ITM No. 910-00T

1.0 SCOPE

- 1.1 This test method covers the procedures for verifying the accuracy and off-center error of balances.
- 1.2 The values stated in either SI metric or acceptable English units are to be regarded separately as standard, as appropriate for a specification with which this ITM is used. Within the text, English units are shown in parenthesis. The values stated in each system may not be exact equivalents; therefore each system shall be used independently of the other, without combining values in any way.
- 1.3 This ITM may involve hazardous materials, operations, and equipment. This ITM does not purport to address all of the safety problems associated with the ITMs use. The ITM user's responsibility is to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2.0 REFERENCED DOCUMENTS

- 2.1 AASHTO Standards
M 231 Weighing Devices Used in the Testing of Materials

3.0 TERMINOLOGY

- 3.1 Terms and Abbreviations. Definitions for terms and abbreviations will be in accordance with the Department's Standard Specifications, Section 101 and the following:
- 3.2 Accuracy. The degree of agreement of the measurement with the true value of the quantity measured.
- 3.3 Off-center errors. The differences in indicated mass (weight) when a sample weight is shifted to various positions on the weighing area of the sample pan.

4.0 APPARATUS

- 4.1 Balance, a Class G₂, G₅, or G₂₀, conforming to the requirements of AASHTO M 231.

4.2 A set of weights up to the capacity of the balance with sufficient subdivisions of weight so that increments of about 10 percent of the capacity up to the capacity can be tested. The weights shall be ASTM Class 3 weights traceable to the National Institute of Standards and Technology (NIST). The standard weights shall be calibrated at a minimum frequency of once each 12 months.

4.3 Thermometer, room temperature, with a resolution of at least 1 °C.

5.0 SIGNIFICANCE AND USE

5.1 This ITM is used by laboratory personnel to verify the accuracy and off-center error of balances.

6.0 PROCEDURE -- GENERAL

6.1 Use the balance in the manner recommended by the manufacturer for each step of the verification procedures.

7.0 PROCEDURE -- ACCURACY

7.1 Clean the balance and standard weights with a lint free dry cloth.

7.2 Place the standard weights near the instrument.

7.3 Allow the balance and the weights to stabilize to the ambient working temperature.

7.4 Place the thermometer on the bench near the balance and record the temperature.

7.5 Place the standard weight(s) in the center of the balance pan in increasing increments of about 10 percent of the capacity and record the indications. If possible, the weights should be stacked upon each other.

8.0 PROCEDURE -- OFF-CENTER ERROR

8.1 Place the standard weight(s) equal to half-capacity of the balance on the center of the sample pan and record the indication.

8.2 Place the same standard weight(s) on each corner of the sample pan and record the indication.

9.0 TOLERANCES

9.1 G 2 Balance

9.1.1 Within any interval equal to about 10 percent of the capacity of the balance, the accuracy shall be equal to 0.2 g or 0.1 percent of the test load, whichever is greater.

9.1.2 The maximum off-center error shall be equal to or less than 0.2 g.

9.2 G 5 Balance

9.2.1 Within any interval equal to about 10 percent of the capacity of the balance, the accuracy shall be equal to 2 g or 0.1 percent of the test load, whichever is greater.

9.2.2 The maximum off-center error shall be equal to or less than 2 g.

9.3 G 20 Balance

9.3.1 Within any interval equal to about 10 percent of the capacity of the balance, the accuracy shall be equal to 5 g or 0.1 percent of the test load, whichever is greater.

9.3.2 The maximum off-center error shall be equal to or less than 5 g.

BALANCE VERIFICATION **ITM 910**

Model Number:_____ Serial Number:_____

Standard Weights NIST Number:_____

Temperature:_____

ACCURACY			
MASS APPLIED	INDICATION ON BALANCE	MASS DIFFERENCE	PERCENT OF ERROR

OFF-CENTER ERROR			
MASS APPLIED	LOCATION	INDICATION ON BALANCE	MASS DIFFERENCE
	Center		
	Corner		
	Corner		
	Corner		
	Corner		

Remarks _____

Verified by _____

Date: _____

Next Due Date: _____